

REMARKS

I. Status of the Application

Claims 1-13 and 15-18 are pending in the application. Claims 1 and 15 are amended. Applicant respectfully submits that any amendments are supported by the specification.

The Examiner rejected claims 1, 3-13, 15 and 17-18 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,313,061 to Drew et al. ("Drew"). Claims 2 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Drew in view of U.S. Patent No. 7,367,216 to Bonne ("Bonne"). Applicant respectfully traverses the rejections in view of the remarks herein. Applicant believes the present application is in condition for allowance and respectfully requests notice of same.

II. Rejections

The Examiner rejected Claim 1 under 35 U.S.C. §102(b) as being unpatentable over Drew. Applicant respectfully submits that the Examiner has incorrectly construed the teaching of Drew in an attempt to read the claimed invention onto the teaching of Drew. It is submitted and will become evident from the following that Drew is not a valid §102(b) against claims 1 and 15 as it does not disclose each and every element of these claims. Furthermore, each of independent claims 1 and 15 are further amended to clarify additional differences between the claimed invention and the teaching of Drew. It is respectfully submitted that these claims are further distinguished from the teaching of Drew, and the objection should be withdrawn.

Claim 1 of the instant application requires (emphasis added):

A mass spectrometer system comprising **a mass spectrometer device provided within a pre-evacuated chamber, the chamber having an entrance port** through which a sample may be introduced into the chamber and into contact with the mass spectrometer device, the system additionally comprising **a permeable membrane located across the chamber between the port and the spectrometer device and a valve located between the membrane and the entrance port** and having a closed state and an open state, such that, in use, the adoption of the open state allows the flow of the sample into the chamber through the membrane and into contact with the spectrometer device **and a reduction of the pressure differential across the membrane.**

In discussing Claim 1, the Examiner contends that Drew teaches each of the elements of claim 1. Careful review of Drew, and the passages and figures referenced by the Examiner, offers no support for such an assessment.

The claimed invention requires the mass spectrometer device to be within an evacuated chamber. The evacuated chamber comprises a port—it is explicit that the port is an element of the chamber. The permeable membrane is located between the port and the spectrometer device. A valve is located between the membrane and the port. It is evident that as the port is an element of the evacuated chamber and the valve and membrane are downstream of the port that the valve and membrane are within the evacuated chamber. Furthermore the system of claim 1 provides the evacuated chamber as a pre-evacuated chamber such that on opening the valve a pressure differential is generated across the membrane that through the passage of time is equalized by the introduction of a sample into the chamber and the simultaneous reduction in pressure as the pressure within the pre-evacuated chamber increases. Without any additional pumping of the pre-evacuated chamber, an opening of the chamber to the ambient conditions external to the chamber provides for the increase in pressure within the chamber such that ultimately there is no pressure differential across the membrane—see for example Page 13, lines 1 to 5 of the published specification.

In rejecting Claim 1 the Examiner points to Figures 1a and 14 of Drew. It is true that Drew teaches a mass spectrometer system. This system is identified at Col. 7, line 61 as being the *mass spectrometer system 18*. It is evident, therefore, that the dash line 18 of Figure 1 surrounding the vacuum pump, the mass analyzer, the control electronics 28 and the high voltage power supply is provided for illustrative purposes only to show components of the system itself as opposed to any one integer of the system. There is no teaching in Drew that the dash line 18 of Figure 1a is in fact a physical component; it is in fact just a schematic graphical tool. There is further no teaching within Drew that everything within the schematic line 18 of Figure 1a is within an evacuated chamber. In fact the person of ordinary skill would readily recognize that elements such as the control electronics, the high voltage power supply and the high vacuum pump (all shown in Figure 1a) would not be within an evacuated chamber.

Indeed at Col. 8, lines 44 onwards Drew is explicit to what is within and not within what Drew terms the vacuum envelope. Drew is explicit in that the mass spectrometer device component of the mass spectrometer system, what in Drew is termed the mass analyzer and

given the reference numeral 21 is the element within a vacuum envelope 20. It is evident, therefore, that when comparing the first pre-evacuated chamber of the present invention with elements of the disclosure of Drew, that it is the vacuum envelope 20 that analogous element as opposed to the entirety of the system 18.

Having identified the evacuated chamber of Drew, i.e. the vacuum envelope 20, one can then turn to see if that chamber has an entrance port leading to a valve leading to a membrane, as is provided in the present invention. Careful review shows that there is no teaching within Drew of a valve and membrane being elements of the vacuum envelope.

Regarding the elements identified by the Examiner, the element 228, the membrane separator 16a and the valve 1406, are all shown as being within a thermal zone 1400, which is detailed in Col 20, lines 1 to 5, is provided to house all of the heated components to prevent heat losses and to conserve power. The mass analyzer 18 is not provided within that thermal zone 1400; it is not even shown as an element within Figure 14. The thermal zone cannot be considered a first evacuated chamber per the present invention as there is no teaching that it is evacuated in any way. The mass analyzer 18 of Drew, which for the sake of argument could be considered a mass spectrometer device of the present invention, is housed within the separate vacuum envelope 20. As each of the elements do not share the same evacuated chamber, which is a requirement for the system of claim 1, it is respectfully submitted that the objection is not valid and should be withdrawn.

Furthermore, the system of Drew is designed to operate in a different fashion to that of the system of claim 1. For example, the opening of the valve within the arrangement of Drew does not cause an equalization of pressure. Drew is unambiguous in its teaching that the introduction of the sample into contact with the mass analyzer is caused by the action of the pump and that the pressure within the vacuum envelope is maintained at a pressure of about 10^{-4} to 10^{-6} Torr by the action of an internal pump (Col. 3, lines 41-43; Col. 12, lines 58-60; Col. 20, lines 41-60). The use of the system of Drew does not result in an increase in the pressure within the vacuum envelope as the provided pump is constantly maintaining the pressure within that envelope at the desired level. In contrast the opening of the valve of claim 1 causes *a flow of the sample into the first chamber through the membrane and into contact with the spectrometer device and a reduction of the pressure differential across the membrane.*

It is evident, therefore, that the system of Drew is different in both arrangement and performance to the system of claim 1. Applicant respectfully requests that the rejection be withdrawn.

With regard to Claim 15, it is noted that the same argument applies *mutatis mutandis* in that the claim is limited to a system which is configured *such that, in use, breaking the seal allows the flow of the sample into the chamber through the membrane and into contact with the spectrometer device and an increase in pressure within the evacuated chamber.*

Furthermore, the valve seal of claim 15 is identified as being a **permanently** breakable seal, i.e., one that once broken is permanently open. The Examiner has indicated with respect to claims 3-4 and 17-18 that Drew teaches a rupturable diaphragm or the provision of a valve formed from a breakable glass member. With due respect to the Examiner, the alluded to solenoid actuated latching mechanisms of Drew are not single use valves such as is provided by a permanently breakable seal, rupturable diaphragm or breakable glass valve. They are multi-use valves, and there would be no motivation to change the system of Drew to a single use valve mechanism that once actuated to the open position could not be closed. The two are not the same, and there is no motivation for the person reviewing Drew to modify it to be a single use device.

It is evident, therefore, that the independent claims are suitably distinguished from the teaching of Drew and the objections should be withdrawn. The remaining claims by virtue of their dependency on claims 1 and 15 are also valid in light of the differentiation of their base claim from the cited art. The objections against those claims should also be withdrawn.

For the sake of completeness, however, Applicant will now address some of the features of some of the dependent claims and discuss the relevance, if any, to the cited art.

Turning initially to claims 3-4 and 17-18, the above argument with reference to claim 15 and the permanent nature of the opening of the valve applies *mutatis mutandis* to the non-relevance of Drew to the specifics of these claims.

With regard to the limitations of claim 9, the additional restriction of the system comprising a second evacuated chamber, the first chamber being provided within the second chamber. In the office action the Examiner has asserted that the chamber 20 is an evacuated chamber constituting a second chamber. This argument falls for a number of reasons.

Firstly, the argument is inconsistent with the objection raised against claim 1. In stating that the vacuum envelope 20 is a second chamber, the Examiner is required to reverse

the nomenclature previously used in the objection raised against claim 1 where he states that the dashed outline 18 represents an evacuated chamber and now has to call that chamber the second chamber. As is evident from the argument above, there is nothing in Drew to support the allegation that the schematic graphical outline 18 is in fact an evacuated chamber. It is simply a graphical identification of elements of the mass spectrometer system (Col. 7, line 62; Col 8, line 31; etc). Even if graphical outline 18 is a chamber per claim 1, it is not located within vacuum envelope 20, the second "chamber" identified by the Examiner. The rejection therefore fails.

Secondly, assuming for the sake of argument that vacuum envelope 20 is in fact the first chamber and the Examiner should have identified that element of Drew against the first evacuated chamber of claim 1, does that envelope 20 comprise all the elements that the first evacuated chamber of claim 1 comprises? For the reasons identified above in the rebuttal of the objection against claim 1, it does not, so the rejection fails again.

Furthermore, even if vacuum envelope 20 constituted a valid anticipation of the first evacuated chamber and its associated elements per claim 1, which it does not, is it located within a second chamber per claim 9. For this argument to be valid, then the graphical outline 18 needs to be a physical element, an evacuated chamber, and as submitted above it is not. The argument proposed by the Examiner fails again.

Finally, the references to the relative pressures provided by the Examiner in Col. 12, lines 35-46 and Col 26, lines 6-10 are in fact references to the pressure of the same element, that of the vacuum envelope 20, not to the identification of any relative pressure differential between two separate elements. The reference on Col 12 is with regard to the embodiment of Figure 4 where it is evident that the vacuum shut off valve 46 is controlling the vacuum to the vacuum envelope 20 within which the analyzer 21 is located. The reference on Col. 26 is explicit to the pressure being related to the vacuum envelope 20. These are both the same elements and as such the Examiner has failed to provide a citation against a pressure differential between a first and second chamber. In any case the pressure values of each referenced column is to the same pressure range, so even if the two columns were referring to different elements, which they are not, they both are at the same pressure which again is not what is claimed. It is therefore submitted that the Examiner has failed to justify a valid objection against claim 9.

It appears from careful review of Drew that the Examiner has identified a mass spectrometer system that provides the mass analyzer component of that system within a single vacuum envelope. That is all that is disclosed. The present invention is more than simply putting a mass analyzer into a vacuum envelope. The claimed invention requires a vacuum chamber which in addition to a mass analyzer also comprises a membrane and a valve. Such a chamber is not disclosed in Drew. The claimed invention of Claim 1 requires a pre-evacuated chamber, which on opening the valve suffers a loss in vacuum, something that is not provided in Drew. In claims 3-4 and 15-18, the invention requires a permanently breakable seal, something that is not taught by the open-close mechanisms of Drew. Furthermore, Drew does not disclose or teach any benefit from locating its vacuum envelope within a second evacuated chamber as is provided by claim 9.

Claims 2 and 16 are being rejected under 35 U.S.C. §103(a) as being unpatentable over Drew in view of Bonne. Claim 2 depends from claim 1, while claim 16 depends from claim 15. As previously explained, not all of the limitations of independent claims 1 and 15 are taught or suggested by Drew, and the addition of Bonne does not make up for these deficiencies. Therefore, Applicant respectfully submits that claims 2 and 16 are patentable over this combination of references.

CONCLUSION

In light of the foregoing remarks, Applicant respectfully requests reconsideration and allowance of claims 1-13 and 15-18. The Commissioner is authorized to charge any additional fees or credit any overpayments associated with this Amendment to Deposit Account 13-0206.

Applicant further invites the Examiner to contact the undersigned representative at the telephone number below to discuss any matters pertaining to the present Application.

Respectfully submitted,

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